

**APPARATUS AND METHOD FOR COMBINING REALTIME AND NON-
REALTIME ENCODED CONTENT**

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ABSTRACT OF THE DISCLOSURE

Methods for slice-based encoding of program guides and user interfaces. The
5 program guides include multiple video streams for picture-in-picture and other applications.
A method for encoding the program guide includes encoding a first set of slices for each of a
plurality of graphics pages; and encoding a second set of slices for each of a plurality of
video streams.

The user interfaces are multi-functional and may be used for electronic commerce and
10 other applications. A method of generating the user interface includes encoding a set of
slices for each of a plurality of objects, each object being characterized by an identity, at least
one attribute, and at least one operation. In one embodiment of this method, the plurality of
objects include an electronic commerce object, where the electronic commerce object is
attributed with a first hyper text markup language (HTML) page.

A head-end centric system and apparatus for encoding and delivery of realtime and
non-realtime content, including: a non-realtime content source for providing non-realtime
content; a non-realtime encoder for encoding the non-realtime content into encoded non-
realtime content; a realtime content source for providing realtime video and audio content; a
realtime encoder for encoding the realtime video and audio content into encoded realtime
20 video and audio; a remultiplexer for repacketizing the encoded non-realtime content and the
encoded realtime video and audio into transport packets; and a re-timestamp unit coupled to
the remultiplexer for providing timestamps to be applied to the transport packets in order to
synchronize the realtime and non-realtime content therein.